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his owner opened the door of the cage and set him free. Whether he ever returned to his new home after having migrated southward, or whether he found his way back to the Bahama Islands from which he had probably been blown, I do not know; but I do know that he was a happy little bird when he escaped from his confinement, and as if trying to express his gratitude he perched on a limb near the house and sang a little song of joy.

The Colorado Desert for ferns

F. T. PEMBER

As most people know, the Colorado Desert is mostly in California but takes its title from the great river of that name, which forms the eastern boundary of the state. It is over 200 miles long, extending from Banning on the north, not only to but far beyond the Mexican line on the south. Its thousands of square miles of hills and valleys, drifting sand dunes, and black lava rocks, are in most part as utterly barren and lifeless as anything on earth, though in places creosote bushes, greasewood, various cactuses, and other desert plants grow here and there and with the daily mirage lend interest amid the general desolation. The scant rainfall of $2\frac{1}{2}$ to 3 inches yearly is what makes the region a desert. It is hot in winter but worse in summer, with an almost unbearable temperature of 115° to 118° F. in the shade. The last place in the world to look for ferns, you will say. So it is, and none exist in the open desert. But on its western side the San Jacinto Mountains rise to a height of 11,000 feet, are covered in part with pine forests, and hold the winter's snow most of the year. When the snow melts, it sends clear cold streams down each rocky canyon, only to be lost in the desert sands. At the base of these mountains is a level tract of desert land of some 10,000

acres, which is protected from the prevailing desert winds by outlying hills and mountains. This has a wonderful mineral, health-giving, hot spring, about which a little hamlet has grown, called Palm Springs, which is becoming famous as a resort for consumptives; and many cures are reported. The mountain canyons that debouch into this basin are Chino, West, Andreas, Murray, Palm, and others. The last is the home of the famous *Neowashingtonia filifera*, and holds groves of it miles in length, the trees standing 70 to 90 feet high. These canyons have some splendid waterfalls and all can be followed far back into the range; but progress is slow, for they are full of rocks, boulders, cactus, mesquite, and a multitude of other stiff shrubs, all of which have thorns or fishhook claws that cling to one persistently all the way.

It has been my fortune to have explored this entire section at different times, but then I was collecting birds for our home museum and devoting little time to botanical studies.

I explored this region in 1887, and again in 1890, and in February 1911 I found myself there once more; this time for the purpose of collecting as many ferns as possible, though knowing that the number would not be large.

As we approach the mouths of any of the canyons, and while yet the country is very arid, we find in abundance, on the north side of the rocks and boulders, the beautiful *Notholaena Parryi* D. C. Eaton. The little fronds are 3 to 4 inches long and have some resemblance to the cotton fern, *N. Newberryi* D. C. Eaton. A little farther on we come to plenty of *N. cretacea* Liebm., a most lovely little triangular frond about 2 inches long and wide. Growing with it, and all the way up the canyons, are quantities of *Gymnopteris triangularis* (Kaulf.) Underw., or the celebrated gold-backed fern. I call it so for want of another name, for while I have collected thousands of fronds of this species elsewhere and ought to know it,

here the growing plants have a wholly changed look. But in dried specimens it is hard to point out differences, except that they are smaller and the stipes so brittle or jointed that it is next to impossible to keep them full length, as they break off an inch or half inch from the frond. I have never noticed this feature in the species from other places and it may be owing to environment, but I predict that some botanist will yet give it specific rank. These three species are all that are common and all that I found in some canyons. A ten-mile tramp to and from Chino Canyon gave me the very rare *Cheilanthes viscida* Dav., a small tufted fern with fronds 4 to 5 inches long, and so sticky that when dried they stick fast to both sheets, and unless much time is spent over it the frond will be about equally divided between the two sheets. Far up Chino Canyon, where immense sulphur springs furnish plenty of water, is an acre or two of *Pteridium aquilinum* (L.) Kuhn. This was out of season, the fronds being too old or too young, but here is where someone makes another species. The old fronds were 4 to 6 feet high and had lost to a great extent their ternate division, the two lower pinnae being smaller in proportion while the main rachis was erect and showed 6 to 8 pairs of side pinnae, thus changing the general look of the plant from that of the east and south. One day I went to a small, steep, rocky canyon, where the only way to travel was by clambering over boulders or jumping from one to another, and when I thought I had gone about as far as possible, I came to a spring over which the rocks formed a projecting hood so that the sun never shone on it. Over this, on a flat rock some 12 feet across and moistened by dropping water, was the freshest, most luxuriant and perfect bed ever seen of *Adiantum capillus-veneris* L., the lovely Venus-hair fern. There seemed to be thousands of large beautifully fruited fronds that would repay a collector for all desert hardships. In this

ideal spot for shade and water, at 1,000 feet elevation, in the perfect calm of this protected valley, but amid the scorched and blistering rocks, one can look between the hills far out on the desert till vision is obscured by swirling sandstorms. These six ferns were all I found, but others and some rarer ones have been taken later in the season in these mountains. I may add that *Selaginella Bigelovii* Underw. was abundant, as it is over most of California.

A hundred miles farther north, on Slover Mt., I secured the rather rare *Cheilanthes Cooperae* D. C. Eaton. In other sections of the state I collected *Polypodium californicum* Kaulf.; *P. Scouleri* H. & G.; *Woodwardia spinulosa* Mart. & Gal.; the intricate lace fern, *Cheilanthes gracillima* D. C. Eaton; cotton fern, *Notholaena Newberryi*; a maidenhair, *Adiantum Jordani* C. Muell.; coffee fern, *Pellaea andromedifolia* (Kaulf.) Fée.; bird-foot fern, *P. ornithopus* Hook.; *Polystichum munitum* (Kaulf.) Presl, and var. *inciso-serratum* D. C. Eaton; *Cheilanthes Fendleri* Hook.; *Dryopteris rigida arguta* (Kaulf.) Underw.; and *Equisetum telmateia* Ehrh. This last has sterile stems 6 feet tall and where plentiful makes a fine display.

Many of the California ferns I have not yet collected, even after many winters spent in the state; but could I be there in June and July and go among the great mountain ranges and through the moister northern sections of the state, I feel sure I would secure some of them; and I live in hope that I may yet do so.

GRANVILLE, N. Y.